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Challenges for Directors of University Natural Science Museums

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ABSTRACT

Universities and natural science museums have a long, productive history; however, this has been an uneasy alliance in the United States at least since the 1880s. Decreasing resources and increasing expectations have made the position of all museum directors extremely difficult, but the situation for university natural science museum directors is probably the most complicated among these because they direct museums that are small administrative units within larger university organizations. Some of their challenges include conflict between museum and university missions, governance issues, relationship between director and the university administrator/board member, lack of understanding of museum functions, middle management role of the director, lack of control of staff time, lack of staff support, public access to museum, and limited public and fiscal support. Solutions offered to meet these challenges include a written mission statement, recognition of education as the primary goal of the museum, a written strategic plan, accreditation, a highly active faculty/staff, documentation of the museum's economic impact, the creation and building of a public support organization, the formation of alliances with local cultural organizations, continuing education for staff, and an open decision-making process.

INTRODUCTION

The alliance between museums and universities has a long history, extending at least from the Italian Renaissance when Ulisse Aldrovandi (1522-1605), professor of natural philosophy at the University of Bologna, created his museum or *studi* (LaurencichMinelli, 1985; Olmi, 1985). He assembled collections of botanical, zoological, and ethnographic materials for the purposes of teaching, research, and publication.

In the English-speaking world, the first university-related natural science museum was the Ashmolean Museum, established at Oxford University by Elias Ashmole on May 26, 1683 (MacGregor, 1985; Ovenell, 1986). The collections, which dealt primarily with the natural sciences, had been accumulated by John Tradescant the Elder and the Younger at The Ark. At Oxford, the collections stimulated research in natural history, especially by the first two curators—Robert Plot (1683-1691) and Edward Lhwyd (1691-1697). By terms of the agreement between Ashmole and Oxford University, the curator was to deliver lectures in natural science and have the museum open to the public on a regular basis.

The use of natural science collections in university education in the United States dates at least to Benjamin Silliman at Yale University. Silliman established a mineralogy collection to assist his teaching of the subject as early as 1807. Silliman also was responsible for establishing the first scientific journal in the United States, the *American Journal of Science*, in 1818 (Kohlstedt, 1988a; Brown, 1989). The use of natural science collections for university education reached an early peak with Louis Agassiz at Harvard University in the late 1840s and the subsequent establishment of the Museum of Comparative Zoology. Agassiz was a powerful figure himself, but his true impact was through the students he trained, who influenced the study of natural history well into the twentieth century (Lurie, 1960; Kohlstedt, 1995).

Even with this long and productive history, the relationship between the campus natural science museum and the university has been an uneasy alliance since at least the 1880s (Kohlstedt, 1988b). At that time universities were consolidating individual collections on campus; states were mandating the establishment of museums on campuses; and there was competition for space, research topics, and funding among faculty. Late in the nineteenth century, this problem was further magnified because of a split between traditional natural history and what has become academic laboratory biology (Benson, 1988).

It is in times of decreasing resources and changing philosophies that the alliance between museum and university has been the most uneasy. Today we find ourselves in a situation not dissimilar from the late nineteenth-century dilemma. Our institutions are faced with decreasing resources and increasing expectations. There are further splits in the biological sciences into those biologists interested in systematics, evolution, ecology, biodiversity, and conservation biology on the one hand, and those biologists who are more molecular in their approach, emphasizing biotechnology and human health issues (Bartholomew, 1986).

Boyd (1995) provided insight into the problems of decreasing resources and increasing expectations faced by all museum directors, which were reflected in shrinking candidate pools and increasing turnover in these positions. These pressures are felt even more intensely by university museums and their directors (Wilson, 1988). There have been a number of closings and transfers of university museums in recent years, clearly indicating a shift of interests and resources (Black, 1984; Holo, 1993).

The following discussion includes some of the special challenges faced by university natural science museum directors. These challenges are listed more or less in what I believe is their order of importance. Many of these challenges are the result of the museum being a small administrative unit within a much larger university organization (Adlmann, 1988). Following the list of challenges are potential solutions; however, the solutions are not a one-to-one match with the challenges because some of the challenges may have no solutions. This list is based primarily upon my more than eight years of experience as director of the University of Nebraska State Museum (July 1986 to October 1994) and so pertain primarily to comprehensive university museums, that is, museums with both research and public programs. Those museums with no public programs may face even more challenges because they do not qualify for many granting sources (Hoagland, 1992; Humphrey, 1991, 1992a, 1992b).

CHALLENGES

Museum and University Missions—Universities generally are defined as educational institutions with a mission of teaching, research, and service. On the other hand, museums are defined by the American Association of Museums as organizations that are essentially educational or aesthetic in nature, that use tangible objects, care for them, and exhibit them to the public (Danilov, 1994). Although there is obvious overlap in these missions, university administrators often question how the campus natural science museum can support the university's mission (Black, 1984; Wilson, 1988). For the university, teaching means formal classroom instruction with lectures, laboratories, taking of notes, review sessions, examinations, seminars, and multimedia presentations. Deviation from these formats is of academic concern and may not be considered teaching. Even though many faculty curators teach in these formal situations, it is usually under the auspices of an academic department rather than the museum; therefore, the department and not the museum will be credited with this teaching activity.

Research is an emphasis that museums and universities share, so this is a portion of the mission that can be a strength for the university natural science museum. One of the primary benefits that universities obtain from research is recovery of indirect costs (overhead dollars), which can be used as desired by the university administration (Higley and Stanley, 1997). No matter how important we believe our research is in taxonomy, systematics, evolutionary biology, paleontology, biogeography, biodiversity, or conservation biology, we must admit that it generally can be performed with less money and thus less indirect costs than studies in biotechnology, nuclear physics, organic chemistry, chemical engineering, or molecular genetics. Therefore, museum research may be seen by the university as being less important than research in other areas of science.

Many universities define service in terms of on-campus duties such as serving on campus committees, participating in academic recruiting, and advising and supervising students. At land grant universities, service includes consulting with citizens and businesses of the state, but universities are usually baffled about how museums might be useful in this mission. Some universities may count service to professional organizations, but this is not always the case.

Governance—*Board Composition*. Although a board of regents, trustees, or some similar group is the ultimate authority for most institutions of higher education, many decisions and the day-to-day operations of the institutions are delegated to administrators. The director of the university natural science museum typically reports to one administrator somewhere in the hierarchy of the institution. There may be directors of freestanding museums saying "I would die to have a single person to report to rather than an entire board that never agrees." Having a single administrator or a single board member can be an ideal situation, with an opportunity to accomplish many goals, but it can also be the worst possible situation, with nothing being done for years. A director with a board of one can find support changing from week to week, and this unpredictability can be a major challenge for the university natural science museum director. The inertia caused by the diversity of opinions on the larger boards actually gives the director protection and should prevent the frequent unpredictable changes that the single senior administrator can bring.

Interests and Concerns of the Board. Upper-level administrative positions within universities usually are filled by people who have spent most of their careers in traditional academic positions. Often they have advanced through various administrative positions from chair of a graduate committee to chair of a department to dean to vice-chancellor to provost, etc. Likely none of their prior experience will have brought them into contact with a campus museum, so when they assume the administrative position to which the museum reports, they will have no knowledge of museum operations, history, or philosophy and may not have training in a natural science discipline (Wilson, 1988).

The academic fields of the three successive vice-chancellors for research for whom I worked were political science, agricultural engineering, and geomorphology. Many university administrators are willing to learn about a new program in their charge, but they have the same time constraints as all academics. The vice-chancellor for research at the University of Nebraska-Lincoln has administrative responsibility for the State Museum, University of Nebraska Press, federal compliance programs, Research Council, Office of Grants and Contracts, four research centers that receive special funding from the state legislature, distribution of returned indirect cost funds, and for starting a new high technology research park. Clearly, the museum's voice is only one among many.

Most university administrators desire to advance in the administrative hierarchy. Getting a new research park started, keeping the university in compliance with federal mandates for live animal care or human research subjects, or reorganizing a research center is much more likely to get an administrator noticed and advanced than is renovating the campus natural science museum or getting the museum additional funding for collection support or a new educational program. Human nature simply dictates that the higher visibility academic programs command more of the administrator's time and interest than will the campus science museum.

Higher-level administrators in universities are often hired from outside the current faculty and staff based on their administrative and academic records. These administrators are often from outside the state/community with little or no connection to the history, culture, or natural history of the region. Even if the hire is made from within the current faculty, the person may be originally from outside of the state/community. The museum director often finds himself/herself in a situation with a single board member from "out of town." During my eight-year tenure as director, we made the most progress in the three years that the vice-chancellor for research was an agricultural engineer, in fact, a member of the National Academy of Engineers, who was a native Nebraskan. He knew the museum from his childhood, as well as adult years, and remembered the museum's paleontological dig that recovered from near his childhood home the museum's icon, a huge, male Columbian mammoth.

Term of Board Members. Most freestanding museum board members have terms of three to six years. Terms of board members generally are staggered so that no more than 25 to 33% change in any one year. Many boards allow members to serve at least two consecutive terms, and many allow members to return in one to three years after serving a full set of terms. Although continuing education is always important for board members (Ullberg and Ullberg, 1981; Malaro, 1994), these rotating boards represent a considerable amount of continuity, and board memory is quite long.

University museums that report to a single administrator in essence have a board member who generally serves a term of three to four years. In the eight years that I directed the University of Nebraska State Museum, I had three different vice-chancellors for research and three interim vice-chancellors for research. This becomes a challenge for the campus museum director because it represents a total change of the board approximately every 32 months. There is little or no continuity and no institutional memory. The campus museum director must start from the beginning by educating the new supervisor about the museum, its programs, and its needs. This may answer, in part, why university museum directors typically serve for less than four years (Boyd, 1995).

Status of Board. Board members of freestanding museums usually are community leaders with connections in business, public service, and local foundations or are stakeholders in the museum because of their special training (professionals with museum expertise or disciplinary training) or their use of the museum (for example, teachers). These people usually have a high profile in the community and may serve on several different boards.

Campus museum directors may report to administrators at varying levels through the administrative hierarchy, including departmental chair, dean, vice president/vice-chancellor, provost, president/chancellor (Rosenbaum, 1988; Armstrong et al., 1991; Humphrey, 1992a). In a survey of university museums Humphrey (1992a) found 100 in which the director reported to departmental chairs, 29 reporting to deans, 19 to vice president/vice-chancellor/provost, and one to president/chancellor. This situation presents many campus museum directors with a challenge, because the amount of resources available to an administrator usually is relative to their position in the administrative hierarchy, with the lowest positions having the least amount of discretionary resources. Most directors are reporting to departmental chairs—the administrator with the least resources. Birney (1994) documented problems of reduced resources and administrative priorities encountered by the Bell Museum of Natural History, University of Minnesota, in reporting to a collegiate dean.

There also may be a danger in reporting high in the hierarchy. Presidents/chancellors tend to be extremely busy. Directors reporting at this level may find that they are referred to an assistant (who generally has no discretionary resources) rather than having access to the primary administrator. I saw this situation at the University of Nebraska-Lincoln with the campus art museum, where the director reported to the chancellor, but always dealt with the associate to the chancellor. Although the local situation can vary a great deal, in my opinion those museums reporting to vice presidents, vice-chancellors, or provosts seem to have done the best (Birney, 1994).

Status of Director—In freestanding museums the director is top management responsible only to the board, who hired him/her. In campus museums, the director is middle management with responsibilities to the top management of the university (Rosenbaum, 1988). The top management of the university will have many expectations of the director and the museum, including high research output, grant activity, high rate of indirect cost recovery, good public image, teaching in appropriate situations, providing services to citizens of the state/community, continuing to do all things with a decreasing resource base, supporting all university policies even if they harm the museum, doing all of this work without asking for anything, and best of all keeping himself/herself and the staff of the campus museum quiet

throughout the process. The museum faculty and staff expect that the director will fulfill all of their wishes, get them high increases in salary, get more space for the museum, get more resources for all of the museum's programs, promote staff, present a high public profile for the museum, be their advocate within the university administration, keep a warm and friendly relationship with the university administration, and accomplish all of these things without stress and with time to listen to any of their problems.

The problems of serving in middle management are the subject of a small industry of books, workshops, conferences, university courses, professorships, and high-paid private consultants (Bradford and Cohen, 1984). Middle management in business and the not-for-profit sector share many of the same problems, but middle management in a university/not-for-profit situation presents some of its own special challenges. There has been little research done on the nature of these problems and their possible solutions.

Explaining the Museum's Functions. A challenge for campus museum directors is that academicians often do not understand the function of museums (Black, 1984; Wilson, 1988; Humphrey, 1992a, 1992b). This includes top-level university administrators, other deans and directors, and may even extend to faculty/curators and museum support staff. It is very difficult for those outside of the museum profession to see the relationship between the research and collection care functions of the museum and the exhibit and educational programs of the institution (Humphrey, 1991, 1992b). This creates a situation where the director is constantly defending one or the other of these functions, and the museum is always in danger of being split into freestanding public galleries and having the research and collection activities placed into cognate campus departments. In the university setting I have found that the research function of natural science museums is easier to defend than the public program function, although the role of the research collections is rarely appreciated.

Authority to Manage Staff. In freestanding museums, curators and other staff work solely for the museum. In university museums, the situation may be quite different (Humphrey, 1992a). The support staff of university museums are primarily employees of the museum, but for many university science museums the number of permanent support staff is often limited, with students, particularly graduate students being trained for research careers, filling many of these positions. Humphrey (1992a) found that faculty curators were most often (41% of universities surveyed) appointed to full-time tenure track positions within campus academic departments; the next most frequent arrangement was joint tenure-track faculty between an academic department and the campus museum (35%); the least common appointment was as tenure-track faculty or non-faculty curatorial staff in the museum (24%). In joint appointments, an important issue is where the tenure is granted. Usually it is in the academic department. Only a few university natural science museums are tenure-granting units. The University of Nebraska State Museum has had this right since 1976, when it was granted by the Board of Regents (the same time that it was granted to the university libraries). Only as a tenure-granting unit can a university natural science museum truly control the time of its senior staff.

Directors of all museums may find 'over time that the support they receive from the museum staff has declined. Because university science museums are small units within much larger organizations, university museum staff will find many more formal and informal routes available to them to express their dissatisfaction within the larger university organization than will the staff of freestanding museums, where generally only routes internal to the museum are available.

The Public Dimension—*Museum Access*. University campuses are places avoided by many people because they feel intimidated by them. This is true at all times except Saturday afternoons in the fall, when the home team is in town—then 80,000 people can find the campus and are willing to walk up to two miles to reach the mecca of the home stadium. Unfortunately, campus museums do not enjoy this drawing power. Lack of access to the museum limits visitorship, which translates directly into a lower public image, lower public support, and less federal and state grant dollars for the museum (Hoagland, 1992). Some of the access problems that a university natural science museum director must address include regional and local directional signs, campus signs to identify the building that the museum occupies, parking, and accessibility for the disabled. In my experience, parking is the most difficult of these access issues and is an emotional issue for everyone on campus. Parking also brings the director into direct contact with the middle-level campus bureaucrats.

Signs on state and federal highways are easier to obtain than signs on interstates. In Lincoln, we were able to get an interstate sign only when a new exit was constructed on Interstate 80 and all of the attractions in Lincoln joined together to push for the sign. The new exit sign has one line stating "Zoo and Museums." Museums can also erect of right-of-way signs, but this requires renting property for the sign, getting necessary permits, renewing the permits annually, paying for the sign, and paying for the maintenance of the sign. The City of Lincoln was far more cooperative in placing directional signs than was the university. The University of Nebraska State Museum went beyond signs with the erection of a life-sized bronze Columbian mammoth in front of the museum building. This required approval from the Campus Esthetics Committee. Dealing with access for disabled visitors is becoming easier as most universities are moving to comply with the requirements of the Americans with Disabilities Act.

Fund Raising. All museums depend upon public support at least for visitor attendance. However, university museums are rarely encouraged to have active development efforts because the parent universities are aggressively seeking public funding themselves. At Nebraska, we cannot approach businesses, corporations, or foundations for financial support without clearing the request through the university hierarchy and then having it placed on the University of Nebraska Foundation's list of priorities. After a four-year process, we were included in the Foundation's new major fund drive. Two years into the campaign, I have not heard that we received any financial resources.

SOLUTIONS

Missions and Strategic Planning—*Importance of a Mission Statement*. This is the most important document a university museum can have, especially if its mission and relevance within the parent organization is being questioned; however, Cato (1993) found that about 20% of the 29 university science museums she surveyed did not have written mission statements. The mission statement should be concise and should articulate what the museum is and what it does (Cato, 1994; Hoagland, 1994). This statement should be known and understood by all staff members of the museum. The director should have at least a 30-second and a two-minute defense and statement of the value of the museum prepared based on the mission statement,

should commit these to memory, and be ready to recite them given even the slightest opportunity. The mission statement should be used as the starting point for the training of the board member/administrator of the museum and other top administrators of the university (Malaro, 1994). The mission statement of the University of Nebraska State Museum has been part of the Regents Bylaws for the university since at least the 1970s. This gave our mission statement a strong sense of being "official" within the university.

Purpose of Museum. Cato (1993) documented in a survey of museums that education was considered to be the most important philosophical goal or purpose of the institution; however, this was stated by only about 37% of all 57 of the museums she surveyed and 32% of the 28 university science museums. I believe that all natural science museums must come to see that philosophically the most important goal of the institution is education, and this is especially true for university science museums. Education is important to the university museum because it serves as a common link between the mission of the museum and the mission of the university. The university museum is not something strange or alien to the university, but rather it is a unit with the same goals, using different methods to achieve them.

This primary goal of education is accomplished through the following activities: (1) research, which generates new information about the natural world and is presented in publications, teaching, and public programs; (2) formal teaching, which is generally performed by faculty curators through cognate academic departments (Wilson, 1988); (3) informal teaching, accomplished through the museum's educational programs, both in-house and outreach (Diamond, 1982, 1986; Munley, 1986; Diamond et al., 1987; Craig, 1988; Wilson, 1988); and (4) exhibitions, which present ideas about the natural world—the very best of these will be based upon the research of faculty curators (Diamond, 1992). The fact that all of these educational activities are based upon three-dimensional objects is what distinguishes the university natural science museum from the university academic department (Black, 1984). The museum's collections are therefore a means to an end rather than an end in themselves.

Strategic Planning. The most important document for a museum after a mission statement is its strategic plan. This is especially true for university science museums because of their quickly changing administrative situation. The planning process for the strategic plan can be as valuable to museums as the document itself. There are many ways to construct strategic plans (McHugh, 1980; Smiley, 1992; Bryson and Alston, 1996), but probably the most successful plans are made by a broad-based group including staff, faculty curators, academic faculty, users of the museum, teachers, community leaders, and even non-users of the museum. This gives a plan built from the bottom of the organization and then moved upward, thus creating as many stakeholders in the process as possible. The strategic plan is usually written by a paid consultant or someone, such as the director, at the top of the museum's administration.

It is most important that the plan be accepted by the museum's staff and the university administration. Many strategic planning efforts are successful to this point, but then 'the plan is placed on a shelf and never implemented. It is the responsibility of the director, because of his/her pivotal position between the board, stakeholders, and their resources and the staff and their time and talents, to implement the plan. The director should use the plan as the official guiding document of the museum and use it in a continuing effort to educate the top-level administrators of the university about the museum's goals and needs for the future. The plan will allow the director to present a consistent and consensual story to all who want or need to

know about the museum's plans, particularly within a university system. The other manner in which the director is responsible for implementing the strategic plan is to be certain that it becomes part of the goals and objectives of the museum staff. Accomplishing these goals and objectives should be made a part of the staff's annual evaluations.

Accreditation—Accreditation is a word and concept that is understood by university administrators because many of the programs on campus will undergo this process. Administrators consider it a black mark on their records to have programs lose or fail to receive accreditation by their profession. The American Association of Museums (AAM) presents university museums an excellent opportunity to engage in an accreditation process. Properly managed, this process can be a powerful tool for the director to benefit the museum and its programs and can be a source of professional pride for the staff.

In preparing for accreditation, university museums will find it extremely useful to participate in the Museum Assessment Program (MAP I, MAP II, MAP III), administered by the AAM, and the Conservation Assessment Program (CAP), administered by the National Institute for the Conservation of Cultural Property. Both of these grant programs provide museums with funds (on a noncompetitive basis from the Institute of Museum and Library Services) that allow them to bring in one or two outside experts to review their programs. The site visit by these outside consultants, which should always include a visit with appropriate administrators, and their final reports can be extremely valuable in validating the needs of the museum.

With these consultant reports in hand, the director should be capable of getting a number of needs addressed during the one-year self-study that begins the AAM accreditation process. The site visit of the accreditation team and the subsequent report from the AAM Accreditation Commission can further serve to highlight and validate remaining needs. These outside views of the museum's programs and needs can be extremely valuable to the director even though the director understood them in advance. Many times the outside voice is heard much more by the university administration than the voices of professional staff on the inside.

Faculty/Staff Relations—*Faculty/Staff Productivity*. Probably the best possible defense a director can have for a museum and its programs is a highly active group of faculty curators and professional staff. Faculty curators who are performing research and publishing the results, receiving outside grants and contracts, teaching courses in their disciplinary specialties, and supporting the museum's public programs are usually viewed favorably by the university administration (Humphrey, 1992a). The professional staff must be caring for the collections with the latest management and preventive conservation techniques to enhance research programs (Duckworth et al., 1993), presenting popular and well-planned in-house and outreach educational programs (Diamond et al., 1988; Deisler-Seno and Reader, 1991; Craig, 1988; Gottfried et al., 1991; Patton, 1991; Diamond et al., 1996) that attract participants, and presenting exciting new exhibits that may include interactive and multimedia presentations that attract visitors (Koran et al., 1986; Feher, 1990; DeMars, 1991; Taylor, 1991; Tirrell, 1991).

Staff Professional Development. It is important that the faculty curators and professional staff have an opportunity for continuing education (Cato et al., 1996). This allows them to remain up-to-date in their professions and helps to enhance their images of themselves and the in-

stitution for which they work. It is particularly important for the staff of university science museums, whose background and experience is primarily in academic situations, to gain a fuller understanding of the overall functioning of natural science museums.

Decision-making Mechanism. All directors should allow all staff members to have input on issues that have an impact on them and the museum. The director should be prepared to hear and consider all ideas before a decision is finalized. It is the professional responsibility of all staff to state openly and honestly their opinions when they are solicited. Once a decision has been made, it is the responsibility of staff members to support the decision both inside and outside of the museum.

Public support—*Public Support Organization*. The Friends of the University of Nebraska State Museum was organized by an interim director of the museum in 1982. At my appointment as director in 1986, the organization had about 250 memberships and eight years later 700 memberships. Nearly all of the important accomplishments during my time as director directly resulted from this group's involvement. They were not rich people, and they were busy people, but they were committed and highly motivated. Their premier accomplishment was successfully lobbying the state legislature for $4 million to renovate and climate control our primary public facility. This effort ultimately involved the Friends of the Museum in coordinating the efforts of 20 other civic and professional organizations and fourth- and fifth-grade students from across Nebraska in what was called the best grassroots lobbying effort in the state's history (Genoways, 1988).

The Friends of the Museum did many other things that helped the museum grow and increase its public visibility, including funding a statewide traveling exhibit program; providing an endowment for a hands-on education gallery; paying for the publication of the popular natural science series *Museum Notes* and annual reports of the museum; and providing part of the funding for the renovation of the central gallery, Elephant Hall. The Friends have taken leadership in planning and raising funds for the life-sized bronze mammoth placed outside Morrill Hall. I would never take the directorship of a university natural science museum without a public support group or without permission to form one. Our Friends were vocal and responsible advocates for the museum inside and outside of the university and significantly increased our public image and support.

Local Alliances. To accomplish certain tasks, especially for the public portion of the museum, I found that forming a working alliance with other cultural organizations in Lincoln was particularly effective. The Lincoln Attractions and Museums Association (LAMA) received the active involvement and support of the Lincoln Convention and Visitors Bureau and obtained funding from the state for joint marketing of our facilities. We also planned joint events, such as celebration of National Museum Day and National Tourism Week, and joint promotions, such as supplying the tray liners for all McDonald's restaurants for one month during tourist season. We planned public programs that complimented rather than competed with each other.

Economic Impact. An argument useful with the University of Nebraska State Museum was documenting the impact of the museum's public programs on the economy of Lincoln and Nebraska. We accomplished this by working with the Lincoln Visitors and Convention Bureau, tourism-related businesses, and the other cultural institutions in Lincoln. Arguing the economic value of our programs was something new for the university administration, and it did

have an impact at the time. University natural science museums should position themselves to be involved in the new push for cultural tourism endorsed by the AAM (Wireman, 1997).

CONCLUSION

A Unique Niche. Given the general and unique challenges confronting university natural science museums and their directors, one could question whether these museums are worth preserving. The answer must be a definite "yes" if research in systematic and conservation biology is to meet and overcome the global biological diversity crisis as described in *Systematics Agenda 2000: Charting the Biosphere* (Cracraft et al., 1994a, p. 2): "*The need for increased knowledge about the Earth's species to guide the world's governments in developing and implementing programs that ensure sustainable use of the Earth's increasingly limited resources.*" To accomplish the objectives of *Systematics Agenda 2000*, systematists are called on to discover, describe, and inventory global species diversity and to make this information available to meet the needs of science and society. A significant number of the systematists needed for this major effort are associated with university natural science museums and departmental collections, and there is no way that *Systematics Agenda 2000* will be successful without the active involvement of university-based systematists (Cracraft et al., 1994b).

To insure the success of *Systematics Agenda 2000*, the program calls for "*a coordinated action plan that substantially increases training in systematics and builds a collection-based infrastructure that includes museums, herbaria, and repositories for microorganisms and genetic resources*" (Cracraft et al., 1994a, p. 16). The only place where new professional systematists are educated is universities, and generally these higher education programs are those associated with university natural science museums or major departmental collections. Also, the human resources needed to build the infrastructure for "*museums, herbaria, and repositories for microorganisms,*" such as collection managers, conservators, registrars, preparators, and research technicians, are educated primarily at universities. This education takes place in traditional academic departments and museum studies programs, which once again usually are associated with university natural science museums or major departmental collections. Thus, it should be clear to all who are concerned about the global biological diversity crisis that university natural science museums, despite their many challenges, must be preserved and enhanced.

Training the Director. If university natural science museums are vital to the future of systematic biology and solving the global biodiversity crisis, then the directors of these institutions must be prepared to meet the unique challenges listed above as well as those challenges faced by all museum directors and leaders of not-for-profit organizations. Few scientists receive management training as part of their academic programs; therefore, continuing education will be the key for preparation of individuals to undertake these challenging positions. Continuing education in administration is offered by many programs (Danilov, 1994). Probably the best known of the management training programs are the Museum Management Institute sponsored by the J. Paul Getty Trust at the University of California-Berkeley and the Museum Management Program at the University of Colorado at Boulder. As the titles of these programs indicate, they focus specifically on museum management issues. More general training in management can be obtained through continuing education courses offered by many col-

leges of business or public administration. Courses in business are most effective if directed specifically toward not-for-profit organizations.

The Right Person at the Right Time. Is there a time when a director should leave the position and when is that time? McHugh (1980, p. 24), writing on strategic planning for museums, made the following point: *"every organization has stages of life, each of which requires different organizational characteristics. For example, the style and qualifications of a museum's director should be different as the institution changes in purpose, scale, community function and maturity."* It is the truly unusual person who will have the range of skills and qualifications to stay with a museum through a long period of its history; therefore, the answer to the question, is there a time when a director should leave the position, must be "yes" in most cases, The much more difficult question to answer is when is the appropriate time to leave. There will be about as many answers to this question as there are museum directors, but for me the time to leave was when I could no longer be effective for the institution and my presence may actually have been hurting it. University and freestanding natural science museums are often looking for new leadership, so directors wishing to leave positions will have an opportunity to find a match between their skills and experience and the needs of another institution. Some museum directors may find the administrative experience rewarding, but others may wish to return to the research and teaching in natural science which initially attracted them to their career.

REFERENCES

Adlmann, J. E. (1988). Museums in academic garb. *Museum News* 67(2): 46.

Armstrong, D. M., H. H. Genoways, and J. R. Choate (1991). University museums of natural history: An informal survey 1990. *ACUMG Newsletter* 8(1): 4-6.

Bartholomew, G. A. (1986). The role of natural history in contemporary biology. *BioScience* 36: 324-329.

Benson, K. R. (1988). From museum research to laboratory research: The transformation of natural history into academic biology. In: R. Rainger, K. R. Benson, and J. Maienschein (editors), *The American Development of Biology* (pp. 49-83). Philadelphia: University of Pennsylvania Press.

Birney, E. C. (1994). Collegiate priorities and natural history museums. *Curator: The Museum Journal* 37: 99-107.

Black, C. C. (1984). Dilemma for campus museums: Open door or ivory tower? *Museum Studies Journal* (4): 20-23.

Boyd, W. L. (1995). Wanted: An effective director. *Curator: The Museum Journal* 38: 171-184.

Bradford, D. L., and A. R. Cohen (1984). *Managing for Excellence*. New York: Wiley.

Brown, C. M. (1989). *Benjamin Silliman: A Life in the Young Republic*. Princeton, New Jersey: Princeton University Press.

Bryson, J. M., and F. K. Alston (1996). *Creating and Implementing Your Strategic Plan: A Workbook for Public and Nonprofit Organizations*. San Francisco: Jossey-Bass.

Cato, P. S. (1993). The effect of governance structure on the characteristics of a sample of natural history-oriented museums. *Museum Management and Curatorship* 12: 73-90.

Cato, P. S. (1994). Variation in operational definitions of natural history in a sample of natural history-oriented museums. *Museum Management and Curatorship* 13: 251-263.

Cato, P. S., R. R. Waller, L. Sharp, J. Simmons, and S. L. Williams (1996). Developing staff resources for managing collections. *Special Publication* (Virginia Museum of Natural History) 4: 1-71.

Choate, J. R. (1980). The Fort Hays State Museums. *University Forum* (Fort Hays State University) 22: 5-9.

Cracraft, J., M. Denton, H. Eshbaugh, M. Novacek, and M. I. Platnick (1994a). *Systematics Agenda 2000: Charting the Biosphere*. Washington, D.C.: National Science Foundation.

Cracraft, J. (1994b). *Technical report – Systematics Agenda 2000: Charting the Biosphere*. Washington, DC: National Science Foundation.

Craig, T. L. (1988). Off-campus audiences benefit from museums in academe. *Museum News* 67(2): 52-56.

Danilov, V. J. (1994). *Museum Careers and Training*. Westport, Connecticut: Greenwood.

Deisler-Seno, J. E., and J. Reader (1991). Development of curriculum-oriented programs for natural history museums: An example in Corpus Christi. In: P. S. Cato and C. Jones (editors), *Natural History Museums: Directions for Growth* (pp. 137-148). Lubbock, Texas: Texas Tech University Press.

DeMars, L. L. 1991. The evolution of exhibitions in a natural history museum. In: P. S. Cato and C. Jones (editors), *Natural History Museums: Directions for Growth* (pp. 125-135). Lubbock, Texas: Texas Tech University Press.

Diamond, J. (1982). Ethology in museums: Understanding the learning process. Museum Education Roundtable, *Roundtable Reports* 7: 13-15.

Diamond, J. (1986). The behavior of family groups in science museums. *Curator: The Museum Journal* 29: 139-154.

Diamond, J. (1992). Issues confronting university natural history museums. *Curator: The Museum Journal* 35: 91-93.

Diamond, J., G. Hochman, S. M. Gardner, B. Schenker, and M. Langan (1996). Multimedia science kits: A museum project on women scientists and their research. *Curator: The Museum Journal* 39: 172-187.

Diamond, J., A. Smith, and A. Bond (1988). California Academy of Sciences Discovery Room. *Curator: The Museum Journal* 31: 157-166.

Diamond, J., M. St. John, B. Cleary, and D. Librero (1987). The Exploratorium's explainer program: The long-term impacts on teenagers of teaching science to the public. *Science Education* 71: 643-656.

Duckworth, W. D., H. H. Genoways, and C. L. Rose (1993). *Preserving Natural Science Collections: Chronicle of Our Environmental Heritage*. Washington, D.C.: National Institute for the Conservation of Cultural Property.

Feher, E. (1990). Interactive museum exhibits as tools for learning: Explorations with light. *International Journal of Science Education* 12: 35-49.

Genoways, H. H. (1988). Director's report. In: B. C. Ratcliffe (editor), *1987 State Museum Annual Report, University of Nebraska-Lincoln* (pp. 1-3). Lincoln, Nebraska: University of Nebraska State Museum.

Gottfried, J., R. Smith, and J. Dacus (1991). The role of natural history museums in improving science education in rural schools. In: P. S. Cato and C. Jones (editors), *Natural History Museums: Directions for Growth* (pp. 171-198). Lubbock, Texas: Texas Tech University Press.

Higley, L. G., and D. W. Stanley (1997). The dark landscape of a world with ten ounces to the pound. *American Entomologist* 43: 210-211.

Hoagland, K. E. (1992). University natural history museums and public service. *Curator: The Museum Journal* 35: 89-91.

Hoagland, K. E. (editor), (1994). *Guidelines for Institutional Policies and Planning in Natural History Collections*. Washington, D.C.: Association of Systematics Collections.

Holo, S. (1993). The university museum: Creating a better fit. *Newsletter of the Western Museums Conference* Summer (2): 1-2.

Humphrey, E. S. (1991). The nature of university natural history museums. In: P. S. Cato and C. Jones (editors), *Natural History Museums: Directions for Growth* (pp. 5-11). Lubbock, Texas: Texas Tech University Press.

Humphrey, E. S. (1992a). University natural history museum systems. *Curator: The Museum Journal* 35: 49-70.

Humphrey, E. S. (1992b). More on university natural history museum systems. *Curator: The Museum Journal* 35: 174-179.

Kohlstedt, S. G. (1988a). Curiosities and cabinets: Natural history museums and education on the antebellum campus. *Isis* 79: 405-426.

Kohlstedt, S. G. (1988b). Museums on campus: A tradition of inquiry and teaching. In: R. Rainger, K. R. Benson, and J. Maienschein (editors), *The American Development of Biology* (pp. 15,47). Philadelphia: University of Pennsylvania Press.

Kohlstedt, K. R. (1995). Essay review: Museums: Revisiting sites in the history of the natural sciences. *Journal of the History of Biology* 28: 151-166.

Koran, J. J., Jr., M. L. Koran, and S. J. Longino (1986). The relationship of age, sex, attention, and holding power with two types of science exhibits. *Curator: The Museum Journal* 29: 227-235.

Laurencich-Minelli, L. (1985). Museography and ethnographical collections in Bologna during the sixteenth and seventeenth centuries. In: O. Impey and A. MacGregor (editors), *The Origins of Museums: The Cabinet of Curiosities in Sixteenth- and Seventeenth-Century Europe* (pp. 17-23). Oxford: Oxford University Press.

Lurie, E. (1960). *Louis Agassiz: A life in science*. Chicago: University of Chicago Press.

MacGregor, A. (1985). The cabinets of curiosities in seventeenth-century Britain. In: O. Impey and A. MacGregor (editors), *The Origins of Museums: The Cabinet of Curiosities in Sixteenth- and Seventeenth-Century Europe* (pp. 147-158). Oxford: Oxford University Press.

Malaro, M. C. (1994). *Museum Governance*. Washington, D.C.: Smithsonian Institution Press.

Mares, M. A. (1988). *Heritage at Risk: Oklahoma's Hidden Treasure*. Norman, Oklahoma: Oklahoma Museum of Natural History.

McHugh, A. (1980). Strategic planning for museums. *Museum News* 58(6): 23-29.

Munley, M. E. (1986). Educational excellence for American museums: The Kellogg Projects in museum education. *Museum News* 65(2): 51-57.

Olmi, G. (1985). Science-honour-metaphor: Italian cabinets of the sixteenth and seventeenth centuries. In: O. Impey and A. MacGregor (editors), *The Origins of Museums: The Cabinet of Curiosities in Sixteenth- and Seventeenth-Century Europe* (pp. 5-16). Oxford: Oxford University Press.

Ovenell, R. F. (1986). *The Ashmolean Museum, 1683-1894*. Oxford: Oxford University Press.

Patton, E. (1991). Natural history loan materials for the classroom. In: P. S. Cato and C. Jones (editors), *Natural History Museums: Directions for Growth*. (pp. 149-158). Lubbock, Texas: Texas Tech University Press.

Rosenbaum, A. (1988). Where authority resides: A look at the governance of university museums. *Museum News* 67(2): 47-48.

Smiley, M. (1992). Strategic planning for nonprofit organizations. National Trust for Historic Preservation *Information Series* 66: 1-24.

Taylor, S. (1991). *Try it! Improving Exhibits through Formative Evaluation*. Washington, D.C.: Association of Science-Technology Centers.

Tirrell, P. B. (1991). Traveling exhibits as a strategy for university-state museums of natural history. In: P. S. Cato and C. Jones (editors), *Natural History Museums: Directions for Growth* (pp. 159-170). Lubbock, Texas: Texas Tech University Press.

Ullberg, A. D., and P. Ullberg, P (1981). *Museum Trusteeship*. Washington, D.C.: American Association of Museums.

Wilson, R. C. (1988). Obscured by ivory towers: The dilemmas of science collections on campus. *Museum News* 67(2): 49-51.

Wireman, P. (1997). *Partnerships for Prosperity: Museums and Economic Development*. Washington, D.C.: American Association of Museums.